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ABSTRACT

Reported is an evaluation of Project ICE conducted in the state of Wisconsin in 1974-75. Project ICE is a five year environmental education project located in Green Bay, Wisconsin and funded by the State of Wisconsin under ESEA Title III. Begun in 1970, the project has developed a series of Supplementary Curriculum Guides for all subjects and all grades, K-12 based on twelve environmental concepts. Each lesson identifies a major concept, provides behavioral objectives, suggests instructional or student activities and lists available resource materials. The program emphasizes flexibility by providing numerous alternatives for each lesson. The sample consisted of students in grades 2, 5, 8, and 11 in 14 schools. Evaluation included cognitive assessment of student achievement, teacher logs, teacher reactions, and parent reactions. Students were pretested in the fall and posttested in the spring. Data favored experimental schools in grades 2, 5, and 8. Data for grade 11 were not significant; this supported observations that the ICE program was not implemented in grade 11 experimental schools. Teachers were generally favorable to the program and many parents indicated they felt increased awareness of the environment in their children's questions, behavior, etc. (RH)

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ED 134446

Final Evaluation Report

Project ICE

C.E.S.A. #9

Green Bay, Wisconsin

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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Introduction

Project I-C-E is a five year environmental education project located in Green Bay, Wisconsin and funded by the State of Wisconsin under E.S.E.A. Title III. Begun in 1970, the project has developed a series of Supplementary Curriculum Guides for all subjects and all grades, K-12 based on twelve environmental concepts. Each lesson identifies a major concept, provides behavioral objectives, suggests instructional or student activities and lists available resource materials. The program emphasizes flexibility by providing numerous alternatives for each lesson.

1973-74 Effectiveness Study

This pilot study employed a pre-post design with experimental and control schools. Project staff designed a cognitive test based on the program's twelve environmental concepts for each of the grades, 2, 5, 8 and 11. Seventy-five or more students at each grade level completed the pre- and post-tests in October and May respectively. Results of the preliminary study are listed in Table 1. In each of the grades tested, students participating in the program improved more during the year than students in the control school who did not have the program.

1974-75 Effectiveness Study

Another investigation of the effects of the I-C-E program was carried out during the '74-75 school year. Not only were data collected on student cognitive outcomes, but teacher logs were developed and parent and teacher reaction to the program and its effect on students were also obtained by the evaluation staff.

Subjects

A total of 14 northeastern Wisconsin schools provided data in this study, with seven schools classified as Pilot 1, four schools as Pilot 2 and three schools as control. The schools are listed in Table 2 according to this status. "Pilot 1" schools had previously been associated with the ICE project in the CESA #9 District while "Pilot 2" and "Control" schools were outside the CESA district and were new to the program as of Fall, 1974. Pilot 2 schools and control schools are of approximately equal size and seem similar rural communities. All available students were used in this investigation, thereby avoiding sampling difficulties. Pilot 1 schools were more heterogeneous, and contained students who have been involved with the program for several years.

Instrumentation

Cognitive. Cognitive instruments reflecting the 12 concepts of the ICE program were reconstructed for each of grades 2, 5, 8 and 11. These instruments represent major revisions of the tests built for the 1973-74 preliminary study. In addition, questionnaires and monitoring forms were constructed by the project staff and evaluation team for use in the experimental schools. In constructing the cognitive instruments, items were written by the project staff and reviewed by a content expert to verify the accuracy of the information and relationship of the item to the program content. The items were also reviewed by the evaluation team for content and form, as the evaluation team had content as well as

TABLE 1

RESULTS OF 1973-74
PRELIMINARY COMPARISON STUDY

Grade	No. Items	Group	X Pre	X Post	Var.	N.	SE diff	t
2	24	E	11.76	13.94	7.98	77	.4279	3.225**
		C	12.22	13.02	7.62	96		
5	36	E	14.04	23.85	85.76	114	1.0153	11.740**
		C	13.14	15.67	21.74	78		
8	36	E	15.16	17.51	25.31	94	.6908	2.533*
		C	15.95	16.65	26.40	127		
11	36	E	14.22	15.88	50.59	74	1.2005	1.978*
		C	17.57	16.84	53.02	70		

* Significant at .05 level

** Significant at .01 level

Table 2

Schools Participating In
1974-75 ICE Data Collection

Pilot 1

St. Joseph's
Denmark
Sevastopol
Notre Dame
Clovis Grove
Marinette Middle
East DePere

Pilot 2

New Holstein
Chilton Catholic
Chilton Public
Chilton High

Control

Kiel Elementary
Kiel Middle
St. Peter & Paul

test development expertise. The tests were tried out with samples of 25 students at each grade of similar background to the experimental and control schools. On the basis of this tryout, items were revised or deleted and the test was then given to 100 children at each grade level to collect statistical information. The evaluation team then employed computer item and test analyses. Items were once again revised on the basis of this information, checked for grade level readability by a reading specialist and final forms of the four tests were prepared for the experimental and control schools.

The value of this very careful test development is apparent in Table 3 which lists the descriptive characteristics of the instruments for the experimental and control schools. Reliabilities of all tests were very good; the lowest was .58 for the second grade pre-test. For post-test, all reliabilities were .70 or better in the experimental schools. As ecology tests have proven extremely difficult to construct due to the generality of the concepts covered, such reliabilities are unusually high.

Teacher log - all experimental group teachers were provided with monitoring forms that were to be filled out after the completion of each lesson. The questions asked for the activity used with each lesson, resources and whether or not the objectives were reached by the students. A total of 203 forms were returned to the project. An example is provided in Appendix A.

Teacher reactions - a reaction form was developed and distributed to each teacher during March. All participating 27 teachers responded to the forms. Reactions were obtained on usage of the program, appropriateness to grade level and behavioral changes in students. A sample is given in Appendix B.

Parent reactions - a parental reaction form was developed and distributed to parents in Chilton Catholic Elementary School, one of the experimental schools. Questions focused on familiarity with the program and any behavioral changes that the parents noted in the students. A sample is given in Appendix C.

Design

Cognitive data were obtained from the students using a pre-post test procedure with 6 Pilot 1 schools, 4 Pilot 2 schools and 4 Control schools. Pre-testing occurred in mid to late October and the post-testing in late March and early April. Results of the pre-test were given to all teachers as soon as scores were available.

Teacher and parent reaction questionnaires were administered once near the end of the school year to the Pilot 2 schools. All teachers were utilized and all the parents in one of the Pilot 2 schools were solicited. Teacher log data gathered periodically throughout the year by the project staff.

TABLE 3

MEANS, STANDARD DEVIATIONS
AND RELIABILITIES OF I-C-E
CONCEPTS TESTS

	Pre-test	Post-test	
	Experimental-Control	Experimental	Control
Grade 2 - 29 Items			
N	404	147	130
X	13.16	17.14	15.45
SD	3.91	4.42	2.97
Rxx	.58	.70	.62
Grade 5 - 44 Items			
N	459	163	155
X	17.50	20.57	19.59
SD	4.82	5.96	5.69
Rxx	.62	.76	.73
Grade 8 - 44 Items			
N	527	259	150
X	21.63	24.05	23.38
SD	6.24	6.70	6.33
Rxx	.77	.80	.77
Grade 11 - 45 Items			
N	472	139	122
X	24.29	25.91	26.24
SD	7.33	7.60	7.07
Rxx	.84	.85	.83

TABLE 4
2ND GRADE
MEANS AND F TESTS FOR
EXPERIMENTAL AND CONTROL GROUPS ON
I-C-E CONCEPTS TEST
(Experimental N = 147)
(Control N = 130)

Concept	Experimental Pre-test Mean	Experimental Post-test Mean	Control Post-test Mean	Experimental Pre-Post Fa	Experimental-Control Post-test Fb
1	1.26	2.03	1.86	52.33**	2.58
2	2.65	3.39	3.42	25.15**	.04
3	.36	.86	.71	39.54**	3.01
4	1.21	1.81	1.34	33.31**	20.26**
5	1.64	2.09	2.09	20.38**	.00
6	2.36	2.58	2.35	3.32	3.28
7	.59	.75	.52	3.35	7.51**
8	1.06	1.09	.99	.07	1.60
9	3.49	4.08	3.59	9.19**	6.50*
10	1.39	1.97	1.76	32.67**	4.29*
11	1.60	1.79	1.38	3.06	13.95**
12	1.91	2.36	2.19	13.16**	1.71
TOTAL SCORE	13.16	17.14	15.45	62.58**	10.97**
ITEMS DIRECTLY INCLUDED	3.01	3.66	3.13	15.78**	10.80**
ITEMS INDIRECTLY INCLUDED	10.15	13.48	12.32	69.94**	7.91**

* Significant at .05 level
** Significant at .01 level

a All significant differences
favor the post test
b All significant differences
favor the experimental group

TABLE 5
5TH GRADE
MEANS AND F TESTS FOR
EXPERIMENTAL AND CONTROL GROUPS ON
I-C-E CONCEPTS TESTS
(EXPERIMENTAL N = 163)
(CONTROL N = 155)

Concept	Experimental Pre-test Mean	Experimental Post-test Mean	Control Post-test Mean	Experimental Pre-Post F _a	Experimental-Control Post-test F _b
1	2.42	2.68	2.31	5.15*	10.93**
2	2.46	2.70	2.45	2.29	2.95
3	2.13	2.39	2.41	4.30*	.02
4	1.17	1.57	1.71	13.91**	1.35
5	.70	1.01	.97	19.24**	.31
6	3.61	4.01	3.63	6.45*	4.26*
7	4.23	4.84	4.81	8.65**	.02
8	.89	.96	1.03	.05	.64
9	3.72	4.28	3.85	9.27**	4.79*
10	1.50	1.72	1.53	3.68	2.63
11	2.78	3.18	3.19	5.07*	.00
12	1.30	1.71	1.47	14.29**	5.44*
TOTAL SCORE	17.77	20.57	19.59	19.05**	2.26
ITEMS DIRECTLY INCLUDED	4.94	5.81	5.31	12.18**	4.27*
ITEMS INDIRECTLY INCLUDED	12.83	14.76	14.28	15.34**	.94

* $p < .05$
** $p < .01$

a All significant differences
favor the post test
b All significant differences
favor the experimental group

TABLE 6
 8TH GRADE
 MEANS AND F TESTS FOR
 EXPERIMENTAL AND CONTROL GROUPS ON
 I-C-E CONCEPTS TEST
 (Experimental N = 259)
 (Control N = 150)

Concept	Experimental Pre-test Mean	Experimental Post-test Mean	Control Post-test Mean	Experimental Pre-Post F _a	Experimental-Control Post-test F _b
1	3.51	3.76	3.39	9.77**	4.64*
2	2.50	2.71	2.61	4.50*	.73
3	2.77	3.12	3.02	13.35**	.54
4	2.39	2.78	2.69	25.72**	.60
5	2.13	2.20	2.31	2.84	.89
6	1.92	1.96	1.89	1.40	.32
7	5.13	5.48	5.71	8.45**	1.24
8	3.11	3.49	3.34	10.40**	1.21
9	1.34	1.47	1.40	4.27*	.83
10	2.30	2.48	2.15	9.82**	11.86**
11	1.98	2.36	2.24	20.03**	1.21
12	1.93	2.15	2.09	4.55*	.37
TOTAL SCORE	21.93	24.05	23.38	22.72**	.99
ITEMS DIRECTLY INCLUDED	8.59	9.60	9.31	18.34**	.86
ITEMS INDIRECTLY INCLUDED	12.23	13.38	13.04	20.94**	.78

* $p < .05$

** $p < .01$

a All significant differences
favor the post test

b All significant differences
favor the experimental group

Results

Analysis of Variance. Cognitive tests were administered to the Pilot 2 and control schools in midOctober and again in late March and early April. Analysis of co-variance was planned for these data; however, it was not possible to initially complete the co-variance for the submission to the Evans Dissemination Review Panel. Therefore, analyses of variance on post-test scores for Pilot and control groups and on pre-post differences for the Pilot 2 group were carried out.

Results of the analysis of variance are given in Tables 3 to 6. Analyses were run on each of the concepts as well as the total score of each test. In addition, project staff classified items as directly or indirectly included in the I-C-E Curriculum Guides. Because the numbers of items differ across concepts in each test, the means vary greatly between concepts.

Results strongly favor the I-C-E program students in all but the 11th grade. The most striking results occurred in the 2nd grade where experimental students were significantly higher than the control group on total score, direct and indirect items and concepts 4, 7, 9, 10 and 11. The experimental group showed significant increases in scores for all but 4 concepts and the experimental group had a higher mean than the control group for all but 3 of the concepts.

Fifth grade results were almost as positive. Although the experimental and control schools did not differ on total score, the experimental group had a higher total mean. Significant differences favoring the experimental group were found for concepts 1, 6, 9 and 12 and they scored significantly higher on the items directly included in the program curriculum guides. The experimental group showed significant increases for all but 3 concepts and mean differences favored the experimental group for 8 of the 12 concepts.

Eighth grade results were also positive. Total score was again not significant but the experimental group has a higher mean, and significant differences were found on concepts 1 and 10. Significant increases occurred for the experimental group on 10 of the 12 concepts and mean differences favored the experimental group on all but 2 concepts.

In contrast to the 2nd, 5th and 8th grade, there was no evidence of effectiveness at the 11th grade. Only one concept was significant, favoring the control school, and this difference had also occurred on the pre-test. The experimental schools showed no significant increases on any of the concepts. These findings affirm impressions of the evaluation team during monitoring visits that, except for one or two isolated instances, the I-C-E program was not substantially implemented at the 11th grade level. This was, no doubt, due to the fact that only three 11th grade teachers participated, which did not provide the necessary saturation of content. At the other grade levels, all teachers participated.

TABLE 7
11TH GRADE
MEANS AND F TESTS FOR
EXPERIMENTAL AND CONTROL GROUPS ON
I-C-E CONCEPTS TEST
(Experimental N = 139)
(Control N = 122)

Concept	Experimental Pre-test Mean	Experimental Post-test Mean	Control Post-test Mean	Experimental Pre-Post F	Experimental-Control Post-test F _a
1	3.25	2.82	2.64	.77	1.44
2	1.93	2.22	2.44	.93	2.99
3	6.06	6.16	5.80	.49	3.11
4	1.68	1.37	1.45	1.49	.47
5	3.32	3.56	3.44	1.09	.41
6	2.57	2.22	2.22	.44	.00
7	2.71	2.81	2.78	.15	.04
8	1.57	1.48	1.57	.05	1.42
9	2.89	2.81	2.85	.05	.09
10	4.14	4.20	4.21	.00	.00
11	1.93	2.22	2.98	1.24	30.88**
12	2.28	2.24	2.23	.05	.00
TOTAL SCORE	25.71	25.91	26.24	.06	.13
ITEMS DIRECTLY INCLUDED	8.50	8.57	9.24	.05	2.82
ITEMS INDIRECTLY INCLUDED	17.21	17.34	17.00	.05	.34

** p < .01

a Significant
difference favors
control group

Table 8

Adjusted Means for Raw Scores
on ICE Cognitive Tests

	Pilot 1	Pilot 2	Control	Pilot 1	Pilot 2	Control	Pilot 1	Pilot 2	Control	Pilot 1	Pilot 2	Control
TAL												
Pre	14.31	13.16	13.27	17.30	17.57	18.07	22.57	21.64	20.03	24.66	23.82	24.33
Post	17.85	17.09	15.49	23.48	20.66	19.88	25.51	24.12	21.88	26.02	25.92	26.30
RECT												
Pre	1.54	1.91	2.00	1.26	1.30	1.15	2.04	1.92	1.88	1.95	1.81	1.93
Post	2.04	2.35	2.20	1.82	1.73	1.45	2.29	2.15	1.81	2.33	2.24	2.24
IRECT												
Pre	3.18	3.01	2.98	5.24	4.90	4.86	8.94	8.57	8.23	8.26	7.72	8.09
Post	3.98	3.66	3.13	7.00	5.84	5.37	10.25	9.61	8.90	8.95	8.57	9.26
	N = 364			N = 382			N = 527			N = 346		

Analysis of Covariance. An analysis of covariance was performed between Pilot 1, Pilot 2 and Control Schools on post-test scores with pretest scores serving as the covariate. Separate analyses were performed on direct, indirect and total score. Direct score was obtained from items directly reflected in the ICE curriculum and the indirect items being related to ICE lessons but not directly related to instruction.

Table 8 presents means for the raw data. These means are adjusted but the relationship between scores is intact. Pilot 2 schools had higher means than the Control school in 2nd, 5th and 8th grade on all post-test scores. The same was true in the Pilot 1 schools except for 2nd grade-direct items where these schools had a lower score than the Control school. In 11th grade control schools had higher scores than Pilot 2 schools on all three measures. Pilot 1 schools for 11th grade performed somewhat better on the post-test than either Pilot 2 or Control. However, there was somewhat better pre-test scores for control schools than Pilot 2 so an analysis of covariance was employed to permit conclusive statements.

The analysis of covariance varified the above conclusions. All F tests were significant at .01 level for 2nd, 5th, and 8th grade students except for 2nd grade-direct. No 11th grade results reached significance.

Teacher Reactions. All 27 teachers who participated in the I-C-E program in the experimental schools provided an overall program assessment as well as responding to monitoring forms regarding each I-C-E lesson. The results of the overall program assessment are summarized in Table 7. The response was overwhelmingly positive. Over 80% found the I-C-E curriculum guides, audio-visual resources and staff assistance very or extremely useful; outside activities of the program were similarly rated by 40% of the teachers (Question #1). Eighty-one percent of the teachers felt the students liked the program either moderately or very much (Question #7).

Examining the content of the program, 78% of the teachers found the lessons to be either very or extremely appropriate to their grade level (Question #3). Of the 12 program concepts, most were considered usable at all grade levels although there was an expected tendency for some of the more concrete concepts (sun energy, clear water, land use) to be more usable at the lower grade levels, while some of the complex concepts (values and attitudes, man changes the environment) were considered more usable at upper grade levels (Question #4). Teachers used the program an average of 2.14 hours per week, with a range from .3 to .8 hours (Question #2). In utilizing the I-C-E materials, 70% said they always or often draw upon the program's cognitive and affective objectives (Question #5). Seventy-four percent of the teachers estimated that the cognitive objectives were attained by 60% or more of their students, while 66% believed the affective objectives were attained by 60% or more of their students (Question #6).

Of particular significance were the student behavioral changes noted by the teachers. A total of 85% of the teachers observed greater student concern for the environment, while 63% noted more discussion of environmental issues and 56% saw a decrease in the wasting of paper. Many teachers also observed changes in other behaviors such as interest in recycling, greater concern for animals and turning off lights when not needed (Question #8).

Table 9

F Tests For All Grades
On Direct, Indirect and Total Items

	2nd Grade	5th Grade	8th Grade	11th Grade
Direct	1.33	4.38*	7.15*	.1713
Indirect	11.18*	12.31*	4.60*	1.15
Total	9.38*	25.14*	5.43*	.38

(2/360 df) (2/378 df) (2/523 df) (2/342 df)

*sig. at .01

Table 10

ICE Program Reactions* of the 27 Participating Teachers*
in 1974-75 Experimental Schools

Item	Percentages					Summary	
	(5)	(4)	(3)	(2)	(1)		
	<u>Extremely Useful</u>	<u>Very Useful</u>	<u>Moderately Useful</u>	<u>Not Very Useful</u>	<u>Rarely Useful</u>	<u>Mean</u>	<u>Standard Deviation</u>
1) Ratings of Program Components:							
ICE Curriculum Guides	30	44	22	4	0	4.00	0.83
ICE Audio-Visual Resources	44	33	19	4	0	4.11	1.12
ICE Staff (Personal Help)	70	23	7	0	0	4.63	0.63
ICE Outside Activities	7	33	42	11	7	3.11	1.19
2) Hours/week use of the program:	Range = .3 hours - 8.0 hours per week					2.14	1.63
3) Appropriateness of Lessons to Grade Level Taught:	<u>Extremely</u>	<u>Very</u>	<u>Moderately</u>	<u>Slightly</u>	<u>Inappropriate</u>		
	15	63	22	0	0	3.93	6.16
4) Usability of Program Concepts:	<u>Second</u>	<u>Fifth</u>	<u>Eighth</u>	<u>Eleventh</u>	<u>Overall</u>		
Sun Energy	66	66	42	0	48		
Ecosystem	83	83	50	0	59		
Population	33	33	42	33	37		
Clean Water	83	100	50	66	70		
Clean Air	66	100	50	33	63		
Natural Resources	66	83	66	66	70		
Land Use	83	100	33	66	63		
Values and Attitudes	33	66	17	100	41		
Man Changes Environment	0	66	83	100	63		
Short Term Gains-							
Long Term Losses	33	17	17	0	15		
Individual Acts	50	50	33	66	44		
Stewardship	17	66	17	33	30		

Table 10 continued:
Item

	Percentages					Summary	
	<u>Always</u>	<u>Often</u>	<u>Sometimes</u>	<u>Rarely</u>	<u>Never</u>	<u>Mean</u>	<u>Standard Deviation</u>
Use of ICE Objectives:							
Cognitive	7	63	30	0	0	3.78	0.58
Affective	4	67	22	7	0	3.67	0.68
Attainment of ICE Objectives:	<u>80-100%</u>	<u>60-80%</u>	<u>40-60%</u>	<u>24-40%</u>	<u>0-20%</u>		
Cognitive	15	59	19	7	0	3.81	0.79
Affective	7	59	26	4	4	3.52	1.09
Students Liked the Program:	<u>Very Much</u>	<u>Moderately</u>	<u>Somewhat</u>	<u>Slightly</u>	<u>Not At All</u>		
	37	44	19	0	0	4.19	0.74
Behavioral Effects on Students:	<u>Second</u>	<u>Fifth</u>	<u>Eighth</u>	<u>Eleventh</u>	<u>Overall</u>		
Concern for Environment	66	100	75	100	85		
Turn Off Lights	66	83	25	0	44		
Talk About Environmental Issues	33	100	58	66	63		
Greater Concern for Animals	100	66	17	0	44		
Interest in Growing Things	66	33	17	0	30		
Interest in Recycling	33	66	50	33	48		
Concern for School Grounds	83	17	17	0	30		
Waste Less Paper	83	50	58	0	56		
Intend to Use Program Next Year:	<u>Second</u>	<u>Fifth</u>	<u>Eighth</u>	<u>Eleventh</u>	<u>Overall</u>		
Yes	100	83	25	33	56		
Maybe	0	17	75	67	44		
No	0	0	0	0	0		

-15a-

There were six 2nd grade, six 5th grade, twelve 8th grade and three 11th grade teachers included.

As a final indicator of acceptance, teachers were asked if they would continue with the program next year. Overall, 56% indicated they definitely would, while 44% indicated possible continuation; no teacher at any grade said they would definitely not continue the program. Continuation was more certain in the elementary grades where scheduling is more flexible, but high school teachers also demonstrated considerable interest in continuing (Question #9).

Teacher Log. A total of 203 forms were received in the following numbers across grades: Grade 2, 49; Grade 5, 68; Grade 8, 66; Grade 11, 20. Teachers rated the activities, the print and audio-visual resources and the I-C-E staff for each concept lesson on a four-point scale of below average, average, above average and superior. In only five cases were any of the three kinds of resources rated as below average; 59% of the ratings were above average or superior. Teachers were asked to evaluate children's attainment of the objectives, indicating whether up to 25%, from 26% to 50%, from 51% to 75% or from 76% to 100% attained the cognitive objectives, the affective objectives and the skills of relevance to the activity taught. In relation to the time spent on each lesson, teachers reported being satisfied when they felt over half of their students attained the objectives. This level of attainment was typically achieved, with rating of attainment in the upper two percentage groups occurring in 78% of the cases altogether, 36% in the top percentage group.

Use of the I-C-E program and accompanying resources varied across the four grades examined. Adaptations of the activities and use of existing resources were more common in the upper grades than in the lower grades. Particularly in Grade 2, and to a lesser extent in Grade 5, teachers used the I-C-E activities as distinct lessons, with some teaching carried out by I-C-E staff. Concepts were combined for a lesson more frequently in the upper grades, with the last four concepts (how man changes the environment, short-term gains vs. long-term losses, individual acts, stewardship) often combined with one another or with earlier concepts related specifically to a single natural resource. Typically, two class periods were devoted to the concept lessons, with the range reported from 1 to 13 periods.

Parent Reactions. Out of 120 questionnaires sent, a total of 107 were returned and analyzed. Results are summarized in Table 8.

Overall, 43% of the parents said they were familiar with the program. Extensive familiarity would not be expected as a supplementary program should blend with the normal curriculum. Even though they were not fully aware of the program, 55% of the parents said their children discussed environmental issues with them and only 20% of the parents disagreed with this statement. In response to the question of satisfaction with the environmental education program, 68% of the parents responded positively and only 8% indicated any dissatisfaction.

The parents were also asked to indicate whether they noticed any change in a number of behaviors in their child since the start of the I-C-E program. A total of 82% of the parents noticed an increase in their child's interest in watching things grow. 75% of the parents stated there was an increase in discussion of environmental problems. High percentages were obtained for most of the other behaviors listed, such as turning off lights, wasting less food and an interest in recycling.

TABLE 11
PARENT'S REACTION TO
I-C-E PROGRAM

Percentages					Percentages				
Item		Agree	Neutral	Disagree	Item		Agree	Neutral	Disagree
1. Parent's familiarity with the program	2nd	40	24	36	3. Parent satisfied with I-C-E program	2nd	62	26	12
	5th	46	38	16		5th	70	22	8
	8th	43	29	28		8th	72	25	3
	Total	43	33	24		Total	68	25	8
2. Child discusses environmental issues with the parent.	2nd	62	18	20	4. The environmental education program should continue	2nd	76	18	6
	5th	60	22	16		5th	78	12	10
	8th	41	38	21		8th	76	20	4
	Total	55	25	20		Total	76	18	6
5. Behavioral changes noted by parents:				2nd	5th	8th	Total		
Talks about environmental problems				73	80	79	75		
Turns off lights & appliances				59	75	56	60		
Wastes less food				60	65	57	62		
Greater concern for animals				24	65	34	32		
Enjoys nature walks more				31	60	38	40		
Conserves more water				36	65	55	48		
Interest in watching growing things				81	85	80	82		
Interest in recycling				65	35	45	56		
Wastes less paper				52	75	48	54		

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Finally, the parents were asked whether or not the program should continue. 76% of the parents indicated a clear interest in seeing the program continue. Only 6% were in favor of discontinuing the program.

Summary. In general, the data collected during the 1974-75 year supports the objectives of the I-C-E program. The extensive collection of cognitive data indicates many students attained the cognitive objectives of the program. The only major exception to this was with the 11th grade students where the program apparently had little impact, at least in the cognitive domain. Response by the teachers was quite positive in terms of both the usability of the program and the effects on students. Parental questionnaires support the teachers observations on students behavior. Parents also generally agreed that the program was worthwhile and should continue.

Appendices

PROJECT I-C-E MONITORING FORM

Appendix A

Please complete this form for each lesson you use from the I-C-E guides.

Grade: _____ Subject: _____ Concept: _____ Page: _____

Approximate class for I-C-E lesson: _____ hrs or class periods.

		RATING					COMMENTS
		Below Average	Average	Above Average	Superior		
What did you do? (Please circle activity letters to tell which you did. Note any adaptations you made.)	In Class	A					Continue on the back of the page, if you wish. Did the children enjoy the activities? Why?
	B						
	C						
	D						
	E						
	-						
	A						
	B						
	C						
	D						
	E						
	-						
What did you use?						Which were outstanding or less useful than you had expected? Why?	
I-C-E publications							
Other publications							
I-C-E audio-visual materials							
Other audio-visual materials							
Who did you use?						Who? How?	
Community Members							
I-C-E Staff							
What percentage of students attained the following:		PERCENTAGES				How do you feel about the results?	
	0-25	26-50	51-75	76-100			
Cognitive objective(s)							
Affective objective(s)							
Skills :							

JCE Teacher Feedback Form

Name _____ School _____

Grade(s) Taught _____ Content Area (if applicable) _____

1. Overall, I would rate the following aspects of the ICE program as:

	Extremely useful	Very useful	Moderately useful	Not very useful	Rarely useful
ICE CURRICULUM GUIDES					
ICE AUDIO-VISUAL RESOURCES					
ICE STAFF (PERSONAL HELP)					
ICE OUTSIDE ACTIVITIES					

2. On the average, I used the ICE program _____ hours per week.

3. Overall, I would rate the ICE lessons on their appropriateness to my grade level as:

extremely appropriate very appropriate moderately appropriate slightly appropriate inappropriate

4. Of the 12 ICE concepts, the ones most usable at my grade level are:

ICE Concepts

___ 1. sun energy	___ 6. natural resources	___ 10. short term gains and long term losses
___ 2. ecosystem	___ 7. land use	___ 11. individual acts
___ 3. population	___ 8. values and attitudes	___ 12. stewardship
___ 4. clean water	___ 9. man changes the environment	
___ 5. clean air		

5. When I taught the ICE concepts, I used or adapted the objectives as found in the ICE curriculum guides:

Cognitive objectives

always often sometimes rarely never

Affective objectives

always often sometimes rarely never

6. When I utilized the objectives provided in the ICE curriculum guides, my students reached the objectives

Cognitive objectives

10-20% of the time	20-40% of the time	40-60% of the time	60-80% of the time	80-100% of the time
_____	_____	_____	_____	_____

Affective objectives

10-20% of the time	20-40% of the time	40-60% of the time	60-80% of the time	80-100% of the time
_____	_____	_____	_____	_____

7. Overall, I would estimate that my students liked the ICE program

very much	moderately	somewhat	slightly	not at all
_____	_____	_____	_____	_____

8. I feel that the ICE program had the following effects on my students. Check all that apply.

My students:

- _____ show an increased concern for the environment
- _____ turn off unnecessary lights and appliances
- _____ talk more about environmental issues
- _____ show a greater concern for animals
- _____ show an increased interest in watching things grow
- _____ show an increased interest in having materials recycled
- _____ show an increased concern for the school grounds (i.e., pick up litter, etc.)
- _____ waste less paper
- _____ other effects? Please comment _____

9. I plan on using the ICE lessons or activities next year. YES _____ NO _____ MAYBE _____

10. For implementation of the program, I feel that the ICE materials along with the inservice training I received were:

- _____ a) totally adequate
- _____ b) of themselves sufficient, but enrichment by ICE staff members was helpful.
- _____ c) not of themselves sufficient, and required assistance from ICE staff members.

11. I estimate I used the ICE staff _____ hours per month.
12. As I became more familiar with the ICE materials over the course of the year, the amount of time I utilized the ICE staff.
- _____ a) increased
 - _____ b) stayed about the same
 - _____ c) decreased
13. For effective implementation of the ICE program, what kinds of personal services do you feel you as a teacher might need? Check all that apply.
- _____ a) someone to lead field trips
 - _____ b) someone to suggest new or altered activities
 - _____ c) someone to suggest available audio-visual materials
 - _____ d) someone to demonstrate or team teach some activities
 - _____ e) someone to identify community resources
 - _____ f) someone to help in coordinating the lessons to eliminate overlap or redundancy
 - _____ g) other (please specify) _____
-

Parent Reaction Form

Please rate the following questions regarding your child's environmental education program. Circle "1" if you totally disagree with the statement and circle "5" if you totally agree with the statement; use the other numbers if your feeling are between. Please consider each statement separately.

- 1) I am familiar with the school's environmental education program.

disagree 1 2 3 4 5 agree

- 2) My child frequently discusses issues relating to environmental problems.

disagree 1 2 3 4 5 agree

- 3) The school is doing a good job of making my child aware of environmental problems.

disagree 1 2 3 4 5 agree

If your child's behavior is different since becoming involved in the environmental education program, please circle "yes". If you haven't noticed any difference since the start of the program, please circle "no".

- 5) My child talks about environmental problems more.

Yes No

- 6) My child turns off unnecessary lights and appliances.

Yes No

- 7) My child wastes less food.

Yes No

- 8) My child shows a greater concern for animals.

Yes No

- 9) My child enjoys nature walks more.

Yes No

- 10) My child conserves more water.

Yes No

- 11) My child shows a greater interest in watching things grow.

Yes No

- 12) My child shows a greater interest in having materials recycled.

Yes No

- 13) My child shows a tendency to waste less paper.

Yes No

- 14) The environmental program should continue:

disagree 1 2 3 4 5 agree

Are there any other changes in your child's behavior that may have resulted from the environmental education program? _____